

Bio-waste Cleaning Boat

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Abstract — This project focuses on the design and making of the river waste cleaning machine. 'River cleaning machine' is a machine which makes possible to remove the waste debris from water surface and safely dump from the water body. The work has done after seeing at the current situation of our national rivers which are dump with daily crore liters of sewage and loaded with pollutants, toxic materials, garbage z etc. Due to increase in water pollution in the form to waste debris, it is affecting the life of aquatic animal and makes their life in harder to lie. This machine will lift the waste surface garbage from the water bodies. This will eventually result in less amount of water pollution and lastly the aquatic animal's death to these problems will be reduced. The main aim of this project is to minimize the manpower and time taken for cleaning the water bodies. In this project we have battery to store the energy and used this energy for cleaning water surface with the help of a motor and chain drive arrangement.

Index Terms—Motor, Chain drive, Propeller, Conveyor, River, wastage, garbage, pollution

1. INTRODUCTION

Cleanliness is the basic need of human society. We need to keep our environment and surroundings clean, but we limit ourselves to the areas in our own surroundings or our society. Maximum of the waste is thrown in the water bodies like seas, rivers, lakes, ponds etc. Hence it causes a high amount of water pollution. Our project aims to get rid of this waste and clean the water surfaces. The whole world is currently facing a lot of problems regarding the poor condition of the environment we live in. India also has drastically affected by this degradation and which has cause increase in water pollution. In India very common problem is water pollution. For many countries, coastline security is major concern. Manual Patrolling is not always possible in few areas. Important task is to have track of all the rivers and lakes banks activities and must be done secretly without anyone's notice. The water cleaning boat has been designed to clean such floating materials from water which has to operate manually via mobile device. This boat can be control using Arduino controller, Bluetooth module, ultrasonic sensor and motor drives etc. When the watercourse garbage clearing boat is used and moves in a watercourse, the dredging sieve makes reciprocating swinging motions under the driving of the transmission mechanism, and then garbage from the watercourse is placed on the conveyor belt of the

floating boat to be conveyed to the garbage collection tank. According to the watercourse garbage clearing boat, garbage and the sewage are dredged from the water by combination of the dredging sieve and a conveying belt, collection then unloading and then conveying of the sewage are fast and easy to use and clearing efficiency is high.



Fig-1: Waste 1



Fig-2: Waste 2

1.1 BACKGROUND

The frequent floating various rubbish that have in the water bodies especially after strong wind and heavy rain, need in time these dirt to be cleaned are transported in order to avoid polluted water affects attractive in appearance. The garbage- cleaning in water bodies by manually concluding, generally is that the cleaning personnel are drawing canoe with the stock salvaging with the string bag mainly at the moment, places below decks after the salvaging again, and Labour intensity is huge, efficient is very low. The utility model provides sort of easy to use for a deficiency that existing water

garbage cleaning technology exist, and also the river garbage that efficient is high is cleared.

1.2 LITERATURE SURVEY

This chapter reviews the literature studied to use varied ideas concerned in delivery the thought of the planned ship into reality. It offers details regarding the work of different authors. Once the thought of such a tool came into our minds, we have tendency to searched to limit the pollution thanks to floating waste. Because the issue is expounded to the surroundings and therefore the pollution has been answerable for terribly forceful changes within the surroundings, we have tendency to started checking out varied surroundings connected journals to seek out any relevant info. "Sirichai watanasophon and sarineeonitrakul," gift the article on the "Garbage assortment automation on the beach exploitation wireless communication." This literature helped united states to find ways in which to tackle the matter concerning communication. Here the user will manage a automation via a program developed from visual basic 2005 application supported window XP. The command from user square measure via Bluetooth. When looking out "Apoorva S. Chaithanya, Rukuma S. Prabhu, Saiswaroop B. Shetty, Denita D'Souza", reveled Autonomous Dustman mechanism Robot, Mangaluru helped U.S.A. in understanding the ideas of autonomous vehicles. . whengathering info concerning the autonomous vehicles, we shifted our focus to such devices operating in water. For additional study "Uman khalid, Muhammad Faizan Baloch", Sensible Floor improvement automation (CLEAR)IEEE, provided to be helpful in understanding the planning, construction and dealing of boat. For any reasonably autonomous remote controlled device, navigation is the most vital half. The failure in communication and errors within the directions given to the vehicle will cause unsought results. To tackle this drawback gave North American nation plan concerning varied aspects of navigation associate degreed movements of an water vehicle. Finally for the coming up with and construction of the negative feedback circuit, offer from the electrical device and wireless communication the concept is taken from concerning a solarised autonomous ship tested to be greatly useful.

2. RELEVANCE

Due to lack of circulation, water will become stale and undrinkable. So as to confirm safe and clean water on board, your boat fresh system must be alter if it hasn't been used for a few time, for instance before your 1st use of the system once your boat has been keep for the winter. So as to scrub boat water tanks, you have got to get rid of the previous water before beginning the medical aid procedure. Your water improvement boat project additionally includes a mobile wireless camera which may facilitate the controller of

the boat to navigate the machine from an Extended distance away. Water improvement boat runs with a motor steam powered propeller that uses air thrust-to push the boat forward. A robotic hand with grabbing and turning ability has been mounted to the front of the boat. The hand will collect waste off the surface of the water and place it into the storage basket positioned at the rear of the boat.

3. EXISTING SYSTEM

Existing technique could also be thought of as a problem since It's terribly rigid. Coming up with is significant. price to take care of. Improvement the boat is extremely huge task. This is thought of as an upscale technique in terms of the information transmission further because the energy value and consumption.

3.1 PROBLEM STATEMENT

Problem statement: In the absence of garbage disposal facilities, the practice of throwing wastage into nearby water bodies has become quite common in recent times and has posed long-term negative impacts both on biodiversity of the area and as well as on the local surroundings. In water related projects, we must emphasis on various concepts related to fluid mechanics like buoyancy and meta centric height. we need to examine the floatability and stability of the product in water.

3.2 PLAN OF THE PROJECT

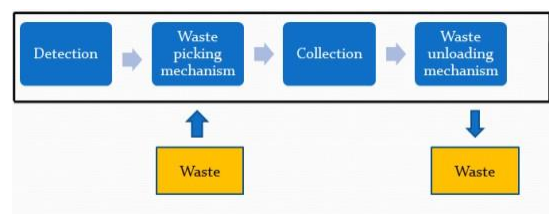


Fig-3: Planning.

As we were working on this project previously so according to waterfall model requirement analysis and system design phase successfully accomplished. Now we are initiating the implementation phase by executing the entire project and concluding to the verification phase. During implementation process, we are building the entire model with the accountability of designing parameters utilizing all the electrical components connections builder software. To reduce the pollution in water bodies. To perform the fast amp; reliable operation during cleaning River. Improve the water quality of a water bodies. So we are trying to work on this project so that ponds and rivers can be cleaned manually or automatically with the help of our water cleaning boat. The main task of this machine is to minimize the manpower, time taken for cleaning the water bodies. To

reduce the pollution in water bodies. Facility of taking out waste particulate floating on water surface. To maintain the automation during cleaning water. To perform the fast amp; reliable operation during cleaning River. Improve the water quality of a water bodies. To work for locals for clean up a section of a water area. To record the collection of wastage removed from the waterway give solutions to local to give better surrounding for aquatic animals and human life.

3.3 PROJECT DESIGN

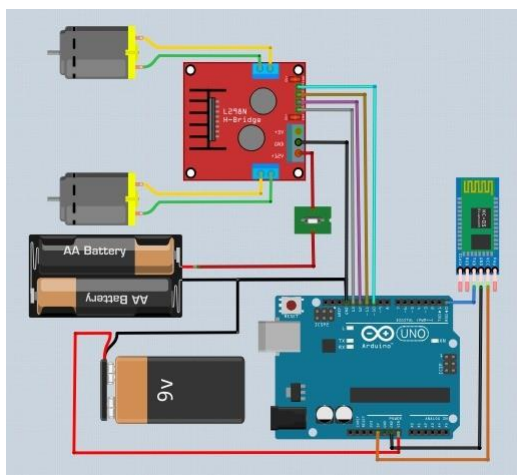


Fig -3.3.1: Design

Mechanical body consists of six parts i.e., conveyor, pipes, propeller, motor, electronic circuitry and arduino. Combination of all the sea parts make sea complete working machine.

A. Conveyor

It is a process where the raw things and products are sent from one manufacturing stage to another manufacturing stage. This is a design such that they are safe to load, easy to use, low in cost, fast. This belt carries wastage from water bodies to the container. This belt includes two pulleys which are powered by dc motors. One end of conveyor belt is fixed on the wooden frame using two small wooden strip and another end is deep in water. This help to collect the garbage from water. Conveyor belt is of length 76.2cm, width 30.40cm.

B. Pipes

The base of the boat consist of PVC pipes i.e., Polyvinyl chloride which is synthetic plastic polymer. As this pipes have less density than water so it can easily float in water. This pipes are air enclose. Pipes size- diameter of 11cm, length of

106.68 cm, width of 50.8 cm. This pipes does not corrode in water.

C. Propeller

It is a type of fan that sends power by converting spinning motion into thrust. A Propellers are used for the movement of the ship. There are two propellers in the ship one on either side that is one on the left side and one on the right side. Both the

propellers are placed at the back so that the maximum thrust generated by the propellers is utilized. Plastic fans are used. Propeller work by accelerating water back ward. The diameter of propeller is of 6cm and run by 2 dc motors.

D. Motor

Permanent magnet DC motors is used for this ship. The motors are selected according to their requirements. Permanent magnet Dc motor(PMDC), provide magnetic field instead of stator winding, which results reduction in speed which gives constant speed for rotation. There are total 4 motors.

E. Motor for Propeller

These motors are so selected that they produce enough forward thrust. These motors are having low torque and high speed. Two motors are used for two propeller of either side. Ratings - 1000rpm, 600mA.



Fig -3.3.2: Propeller

F. Motor for Conveyor

This motor has to perform the operation of rotation of pulley and pull he belt filled with the garbage. So it has to be at low speed-high torque motor. Two motors are used for one pulley, these motor run at the speed of 30rpm, 600Ma.



Fig -3.3.3: Conveyor

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5. APPLICATIONS

1. It is appropriate to lessen water contamination in streams and lakes.
2. It is helpful to lessen the natural marine contamination at the stream, Lake.
3. It is additionally valuable in fishery plants to gather dead fish and strong pollutions in wastewater.
4. It is helpful to eliminate the silt present in swimming pool to keep it clean

6. FUTURE SCOPE

In future this machine can be improved to sort more types of wastages. In this system we can use more advanced conveyor system and conveyor material for maximizing the efficiency of collection of wastage. We can also use solar panels for supplying more power to the boat instead of battery. To modification in the size of boat with respect to its waste collecting capacity can be increases. This project is made for small lake and by doing some changes in its size and capacity it can be used in big water bodies and rivers.

7. ACKNOWLEDGEMENT

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8. CONCLUSION

About 71 part of the earth's surface is water covered and only about 0.3 part of our fresh water is found in the surface water of lakes, rivers, and swamps. In developing countries, 70 part of industrial wastage is dumped into water. Polluting the usable water supply. On average, 22 million tons of fertilizers and chemical waste are used each year. The machine can prove to be a helping hand in controlling the day by day increasing problem of water pollution. It can greatly minimize the problems occurred by floating waste. Also it can be used for the observation purpose and can be used for security purpose. This project can be utilized at multiple places, including rivers ponds and many holy places such as Kumbh Mela and Nashik-Trimbakeshwar Simhastha.

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